35. The high phase order induction machine drive system of claim 34 wherein said at least two winding terminals comprise two winding terminals.

36. The high phase order induction machine drive system of claim 35 wherein said inverter system comprises half bridge output stages.

37. The high phase order induction machine drive system of claim 35 wherein said motor is wound with full span concentrated windings.

38. The high phase order induction machine drive system of claim 37 wherein said inverter system comprises half bridge output stages.

39. The high phase order induction machine drive system of claim 35 wherein said mesh connection having the highest possible skip number between inverter terminals.

a1 Cont SUB B2

40. The high phase order induction machine drive system of claim 35 wherein said two winding terminals of each of said phases are driven by the inverter system with a phase angle difference of close to but not exactly 120 electrical degrees when said inverter system is synthesizing output of fundamental phase relation.

41. The high phase order induction machine drive system of claim 35 wherein said motor comprising N phases where N is either a multiple of 3 or not, and wherein if N is a multiple of 3, said mesh connection being arranged with a skip number of N/3, and wherein if N is not a multiple of 3, said mesh connection being arranged with a skip number of (N/3)-1 rounded to the nearest integer.

42. The high phase order induction machine drive system of claim 41 wherein said variable electrical phase angle comprising the selectable synthesis between current with fundamental phase relation and current with fundamental phase relation multiplied by three.

43. The high phase order induction machine drive system of claim 41 wherein said variable electrical phase comprising a variable proportion of current with fundamental phase relation and current with third harmonic phase relation.

B2 Cont

44. The high phase order induction machine drive system of claim 41 wherein said motor comprising 17 phases and wherein said mesh connection arranged with a skip number of 5 between the two terminals of each winding.

45. The high phase order induction machine drive system of claim 41 wherein said electrical phase variability of said inverter system comprising a variable degree of third harmonic superimposition upon the fundamental phase relation of said inverter.

46. The high phase order induction machine drive system of claim 45 wherein said motor comprising 17 phases and wherein said mesh connection arranged with a skip number of 5 between the two terminals of each winding.

47. The high phase order induction machine drive system of claim 35 wherein said mesh connection is defined as having a skip number of (N-3)/2, where N is the number of phases of said induction motor, and wherein said variable electrical phase is further defined as: an electrical phase increase in response to a signal to increase the impedance of the motor, an electrical phase decrease as a response to a signal to decrease the impedance of the motor, and a minimum electrical phase relation comprising fundamental electrical phase relation.

A1 Cont

SUB B2

48. The high phase order induction machine drive system of claim 35 wherein said mesh connection is defined as having a skip number of 0, and wherein said variable electrical phase is further defined as an electrical phase increase in response to a signal to decrease the impedance of the motor and an electrical phase decrease as a response to a signal to increase the impedance of the motor and a minimum electrical phase relation comprising fundamental relation.

49. The high phase order induction machine drive system of claim 35 wherein said motor having N phases where N is any odd number greater than three, and wherein said mesh connection comprising each inverter terminal being connected to two winding terminals of different windings.

50. The high phase order induction machine drive system of claim 16 wherein said mesh connection having a skip number of (N-3)/2.

51. The high phase order induction machine drive system of claim 35 wherein said motor having N phases where N is any even number greater than 4 and wherein said mesh

connection comprising a plurality of mesh subsets wherein each subset comprising an odd number of phases.

52. The high phase order induction machine drive system of claim 51 each of said subsets having a skip number of skipped terminals within that subset, of N/3, if N is a factor of 3; and (N/3)-1, rounded to the nearest integer, if N is not a factor of 3.

53. The high phase order induction machine drive system of claim 52 wherein said variable electrical phase of said alternating current of said inverter system comprising a variable proportion of current with fundamental phase relation and current with third harmonic phase relation.

54. The high phase order induction machine drive system of claim 51 wherein said subsets having a skip number of skipped terminals within that subset, of (N-3)/2.

A1 Cont

55. The high phase order induction machine drive system of claim 51 where said variable electrical phase of said alternating current of said inverter comprising harmonic waveforms instead of the fundamental phase relation drive waveform current.

56. The high phase order induction machine drive system of claim 51 wherein said variable electrical phase of said alternating current of said inverter comprising superimposed harmonic waveforms upon the fundamental phase relation drive waveform current.

57. The high phase order induction machine drive system of claim 51 wherein said superimposed harmonic waveforms comprising only odd order harmonics.

58. The high phase order induction machine drive system of claim 51 wherein said superimposed harmonic waveforms upon the fundamental phase relation drive waveform current, comprising square waves.

59. The high phase order induction machine drive system of claim 35 further comprising a receptor for receiving signals to vary the impedance of the motor, and wherein said variable electrical phase of said alternating current of said inverter comprising variable harmonic content to the waveform according to the signals received by the receptor.

60. The high phase order induction machine drive system of claim 35 wherein said mesh connection having an odd number of phases and a skip number of (N-3)/2, where N is the

number of phases, or said mesh connection having a plurality of subsets each comprising an odd number of phases and having within the subset, a skip number of (R-3)/2 where R is the number of phases in each subset; and further comprising a receptor for receiving signals to increase or decrease the impedance of the motor, and wherein said variable electrical phase comprising multiplication of the electrical phase angles of the alternating current as a response to a signal to increase the impedance of the motor, and division of the multiplied electrical phase angle by a maximum of previous phase count multiplication, as a response to a signal to decrease the impedance of the motor.

61. The high phase order induction machine drive system of claim 60 wherein said variable electrical phase comprising the multiplication of the phase count of the alternating current by (N-2) as a response to a signal to increase the impedance of the motor and the division of the multiplied phase count by the same as a response to a signal to decrease the impedance of the motor.

a1 sub B2 cont

62. The high phase order induction machine drive system of claim 35 wherein said mesh connection comprising the two terminals of each winding phase being connected with a skip number of zero.

63. The high phase order induction machine drive system of claim 35 further comprising contactors for the switching to a second mesh connection of a different skip number from the first mesh connection, whereby the impedance of the motor may be varied through switching means.

sub B2

64. The high phase order induction machine drive system of claim 35 wherein said motor having 9 or more phases.

65. The high phase order induction machine drive system of claim 35 wherein said motor having 18 phases divided into two subsets of nine phases, wherein each subset having a separate mesh connection with a skip number of 3 within that subset.

66. The high phase order induction machine drive system of claim 35 wherein said motor is a linear induction motor.

B2 Cont

67. The high phase order induction machine drive system of claim 35 wherein said windings comprise single inductors per slot, and wherein said variable electrical phase comprising variable odd and even order harmonic application to the drive waveform.

68. A method for varying the impedance of a motor, comprising

a) connecting a motor having more than three phases to the terminals of an inverter system, with a mesh connection, and,

b) synthesizing alternating current in said inverter system to drive the motor, and,

c) varying the phase angles of the alternating current.

69. The method of claim 68 further comprising the step of

d) receiving signals indicating a requirement to vary the impedance of the motor, and wherein said step of varying the phase angles of the alternating current of the inverter comprises varying the phase angles substantially in accordance with the required motor impedance.

a1 Cont

70. The method of claim 68 wherein said step of varying the phase angles of the alternating current of the inverter comprising decreasing the phase angle difference of the current fed to the two terminals of each winding to increase the impedance of the motor and increasing the phase angle difference of the current fed to the two terminals of each winding to decrease the impedance of the motor.

71. The method of claim 70 wherein the number of phases being odd, and wherein said steps of increasing and decreasing the phase angle differences of the alternating current fed to the two terminals of each winding comprising the switching of the drive waveform from fundamental phase relation to a harmonic thereof and vice versa.

72. The method of claim 70 wherein the number of phases being odd, or wherein the number of phases being even and the mesh connection comprising a plurality of meshes each comprising an odd number of phases, and wherein said steps of increasing and decreasing the phase angle differences of the alternating current fed to the two terminals of each winding comprising exchanging the primary drive waveform with an odd order harmonic thereof.

73. The method of claim 70 wherein the number of phases being odd, or wherein the number of phases being even and the mesh connection comprising a plurality of meshes each comprising an odd number of phases, and wherein said steps of increasing and decreasing the phase angle differences of the alternating current fed to the two terminals of each winding comprising superimposing upon the primary drive waveform, a harmonic thereof, to a required degree of superimposition.

74. The method of claim 70 wherein the number of phases being odd, or wherein the number of phases being even and the mesh connection comprising a plurality of meshes each comprising an odd number of phases, and wherein said steps of increasing and decreasing the phase angle differences of the alternating current fed to the two terminals of each winding comprising ~~superimposing to the primary~~ drive waveform, a plurality of harmonics thereof.

a1 Cont

75. The method of claim 70 wherein said step of increasing the phase angle differences of the alternating current fed to the two terminals of each winding comprising providing alternating current with phase angles multiplied by N-2, where N is the number of phases, and wherein said step of decreasing the phase angle differences of the alternating current fed to the two terminals of each winding comprising subsequently providing current with the original phase angles.

76. The method of claim 70 wherein the motor having a number of phases symbolized by N, and wherein the mesh connection having a skip number of N/3 if N is a multiple of 3, and having a skip number of (N/3)-1 rounded to the nearest integer if N is not a multiple of 3, and wherein said step of decreasing the phase angle differences of the alternating current fed to the two terminals of each winding comprising the step of multiplying each of the phase angles by 3, and wherein the step of increasing the phase angle differences of the alternating current fed to the two terminals of each winding comprising subsequently dividing all of the phase angles by 3.

77. The method of claim 68 wherein the step of varying the phase angles of the alternating current of the inverter comprising the step of providing increasing proportions of an odd order harmonic.

78. The method of claim 68 wherein the step of varying the phase angles of the alternating current of the inverter comprising the step of providing a plurality of odd order harmonics.

79. The method of claim 68 wherein said step of connecting a motor having more than three phases with a mesh connection to an inverter system, is done by using a mesh connection of the type that each winding will have a phase angle difference between the two terminals thereof of nearly but not exactly 120 degrees of primary drive waveform current, and wherein said step varying the phase angles of the alternating current of the inverter is achieved by adding third harmonic content to the primary drive waveform of the inverter.

80. The method of claim 79 wherein said step of adding third harmonic is done by gradually increasing the amount of third harmonic content in the waveform.

81. The method of claim 68 wherein said step of connecting a motor having more than three phases with a mesh connection to an inverter system is done by connecting the motor windings to the inverter terminals to achieve the largest phase angle difference possible between the two terminals of each winding, of primary drive waveform current.

a1 cont

82. The method of claim 81 wherein said step of varying the phase angles of the alternating current of the inverter comprising providing alternating current with phase angles multiplied by N-2, where N is the number of phases.

83. A high phase order motor having more than three phases, connected to inverter output elements with a mesh connection.

SUB B3

84. The high phase order motor of claim 83, in which the skip number of the mesh connection is the highest skip number possible that allows for rotational symmetry.

85. The high phase order motor of claim 83 further including a second mesh connection for additional or alternative connection between the inverter and the motor.

86. The high phase order motor of claim 85 further including contactor arrangements for connecting the motor and inverter with said second mesh connection.

87. The high phase order motor of claim 83 wherein the windings of said motor comprising a plurality of turns, and further comprising switches to operate the turns in parallel.

a1 SUB B3 Cont'd

88. The high phase order motor of claim 83 wherein said mesh connection having a skip number of zero.

89. The high phase order motor of claim 83 wherein said mesh connection having a skip number of (N/3)-1, rounded to the nearest integer.

IN THE SPECIFICATION:

Please amend the specification as follows:

Please delete the section from page 2, line 24, commencing "Most motors are designed for dual voltage operation" to page, 3 line 2 "three contactors, a factor of two change is possible."

a2

On page 3, line 3, please change "The change in series turns may be considered a change in induction machine impedance, or current versus voltage relation." to --The number of series turns in a motor is thus related to induction machine impedance, or current versus voltage relation.--

On page 3, line 32, delete sentence: "This eliminates the need and cost of mechanical contactor arrangements and allows greater variability in impedance."

a3

On page 8, line 17, after paragraph ending "This may be done without contactors.", please insert new paragraph --Fundamental phase relation is both the relative electrical angle of each winding terminal and relative phase relation of the currents driving each winding terminal, such that the stator develops the lowest pole count without discontinuities. In a two pole machine, driving with fundamental phase relation causes the electrical angle of each winding terminal, as well as the phase angle of the currents driving each winding terminal, to be equal to the physical angle of the winding slot associated with that winding terminal. In a four pole machine, the phase angle is equal to double the physical angle of the slot, and in general for an N pole machine the electrical angle between any two slots, and the electrical phase relation of the currents driving those two slots, is equal to N/2 times the physical angle between those two slots.--

On page 8, line 17, please change "With Reference to" to --With reference to--

On page 11, line 14, please delete sentence "Also, contactor arrangements are not essential"